



# ROLE OF ARTIFICIAL INTELLIGENCE IN ENHANCING EDUCATION AND SOCIAL LIFE

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## ABSTRACT

This paper seeks to understand approach and pattern of Artificial Intelligence (AI). It examines the contemporary approaches to Artificial Intelligence.

Artificial Intelligence (AI) is a branch of Science which deals in development of modern machines, which can find solutions to complex problems in human. Artificial intelligence basically works on human intelligence characteristics and algorithms so that machine can behave like human.

**KEYWORDS:** Artificial Intelligence, Enhancing, Education and Social Life.

## INTRODUCTION

### AI in Education

Education can be defined as a process where teachers and students give and receive systematic instructions, respectively. Learning can take place in either a formal or informal setting. More commonly, students receive education in a formal setting such as a high-school, college, university, etc. Education is often considered as a significant determinant of an individual's future success rate. Justifiably, there are various efforts to improve the current education systems in multiple countries worldwide.

Among the many methods employed by various countries to improve the education sector includes the use of AI (Artificial intelligence). AI systems are defined by the use of computers to accomplish tasks that had previously required human intellect. AI utilizes algorithms that collect, classify, organize, and analyze information to conclude it, which is also called machine learning. As such, the use of machine learning has the potential to bring about several benefits for the various industries, including the education system.

Artificial Intelligence in Education Sector enabled solutions and tools empower teachers and students with a wide area of learning and teaching opportunities in various formats. The technology assists institutions in bringing about significant changes in their processes and designing a curriculum based on knowledge. AI, in any form, offers a fascinating way for teachers to teach and help students learn through customized study materials in a friendly environment.

With the advancement of technology, the education sector has also stepped into a new digital era. Along with the various digital tools, artificial intelligence (AI) has had a major impact on the education sector for both students and teachers, and it has revolutionized how we teach and learn new concepts. Here's why it has become a game changer for the education industry.

AI allows the personalization of education for students in ways that they find interesting and by tailoring it to their needs. Thus, as education adapts to the students' needs, it has become easier for them to set and achieve their educational goals.

Today's way of teaching students and their study is very different from what it was some years ago. AI-enabled technology has also allowed administrative tasks to be automated, enabling organizations to reduce the time required to complete tedious tasks and everyday processes.

While AI has been in the education technology space for a while, adoption has been slow. However, during the COVID-19 pandemic, virtual learning forced the industry to shift. AI helps streamline the student education process by offering access to suitable courses, bettering communication with tutors, and giving them more time to focus on other life aspects.

AI is a booming technological domain capable of changing various aspects of the education system. The global Artificial intelligence market in education is forecasted to reach \$3.68 billion. That's a 47% boost of CAGR (Compound annual growth rate) from 2018 to 2023.

AI enhances the personalization of student learning programs and courses, promotes tutoring by helping students improve their weak spots and sharpen their skills, ensures quick responses between teachers and students, and enhances universal 24/7 learning access. Educators can use AI for task automation, including administrative work, evaluating learning patterns, grading papers, responding to general queries, and more.

AI can automate grading, giving educators more time. It can assess students and adapt to their needs, helping them work at their own pace. AI tutors can provide additional support to students, ensuring they stay on track. And it could change

where and how students learn, perhaps even replacing some teachers. The role of artificial intelligence in education can be seen boosting efficiency, productivity, and convenience, providing the sector with a range of different benefits.

At its most basic level, AI is the process of using computers and machines to mimic human perception, decision-making, and other processes to complete a task. Put differently, AI is when machines engage in high-level pattern-matching and learning in the process.

### **The Role of Artificial Intelligence in the Future of Education**

Gone are the days of visiting the library to photocopy a few pages from an encyclopedia for a school project. As generations of children grow up with technology at their fingertips, we live in a world where the internet is their primary source of information, education, and entertainment. A recent survey found that children aged between 8 to 12 spend almost five hours a day looking at screens, while teenagers are clocking nearly seven hours a day of screen time – and that's not counting the time they spend doing schoolwork. Hours spent learning from chalkboards in physical classrooms has also reduced significantly. As technology and society continue to evolve and develop, the way we learn will also continue to change, for children and adults alike.

**“My hope is that by 2030, most of humanity will have ready access to health care and education through digital agents.”**

– Gabor Melli, *VP of artificial intelligence and machine*

The rapid advancement of technologies such as artificial intelligence (AI), machine learning (ML), and robotics impacts all industries, including education. If the education sector hopes to utilize AI's full potential for everyone, the focus should be to continue exposing the next generation to AI early on and utilizing the technology in the classroom. Teachers are already finding that many students use AI through social media and are, therefore, open to its educational applications.

### **Nature of AI:**

There are a number of different ways to understand the nature of AI. Two types of assessment include rules-based and machine learning-based AI. The former uses decision-making rules to produce a recommendation or a solution. In this sense, it is the most basic form. An example of this kind of system includes an intelligent tutoring system (ITS), which can provide granular and specific feedback to students.

Machine learning-based AI is more powerful since the machines can actually learn and become better over time, particularly as they engage with large, multilayered datasets. In the case of education, machine learning-based AI tools can be used for a variety of tasks such as monitoring student activity and creating models that accurately predict student outcomes. While machine learning-based AI is still in its infancy, the approach has already shown impressive results when it comes to complex solutions not governed by rules, such as scoring students' written responses or analyzing large, complex datasets.

Within AI, there are other important distinctions, largely based on the technological use cases. One subfield revolves around natural language processing, which is the use of machines to understand text. Technology such as automated essay scoring uses natural language processing to grade written essays. Also important within AI are recommender and other prediction systems that engage in data-driven forecasting. For example, Netflix currently uses an AI-based recommender system to suggest new films to its users.

Vision-based AI is also an important field that can help with assessment. A number of assessment groups have used optical systems to grade students' work. Instead of a teacher grading a math equation that a student wrote, for example, the teacher can snap a picture of the equation, and a machine will grade it. Finally, there are AI systems based on voice recognition. These systems are the backbone of tools such as Siri and Alexa, and experts have been exploring ways to use voice-based AI to diagnose reading and other academic issues.

According to latest research, definitions of artificial intelligence vary along main dimensions thought processes and reasoning, and behavior. Thus views of AI fall into four categories.

- Thinking Humanly (The Cognitive approach)
- Acting Humanly (The Turing Test approach)
- Thinking Rationally (The Laws of Thought approach)
- Acting Rationally (The Rational Agent approach)

### **Methods and goals in AI:**

Symbolic vs. connectionist approaches

AI research follows two distinct, and to some extent competing, methods, the symbolic (or “top-down”) approach, and the connectionist (or “bottom-up”) approach. The top-down approach seeks to replicate intelligence by analyzing cognition independent of the biological structure of the brain, in terms of the processing of symbols—whence the symbolic label. The bottom-up approach, on the other hand, involves creating artificial neural networks in imitation of the brain's structure—whence the connectionist label.

### **Strong AI, applied AI, and cognitive simulation**

Employing the methods outlined above, AI research attempts to reach one of three goals: strong AI, applied AI, or cognitive simulation. Strong AI aims to build machines that think. The ultimate ambition of strong AI is to produce a machine whose overall intellectual ability is indistinguishable from that of a human being. This goal generated great interest in the 1950s and 60s. Indeed, some researchers working in AI's other two branches are Applied AI, also known as advanced information processing, aims to produce commercially viable “smart” systems—for example, “expert” medical diagnosis systems and stock-trading systems.

In cognitive simulation, computers are used to test theories about how the human mind works—for example, theories about how people recognize faces or recall memories. Cognitive simulation is already a powerful tool in both neuroscience and cognitive psychology.

## Types of Artificial Intelligence

### 1. Purely Reactive

These machines do not have any memory or data to work with, specializing in just one field of work. For example, in a chess game, the machine observes the moves and makes the best possible decision to win.

### 2. Limited Memory

These machines collect previous data and continue adding it to their memory. They have enough memory or experience to make proper decisions, but memory is minimal. For example, this machine can suggest a restaurant based on the location data that has been gathered.

### 3. Theory of Mind

This kind of AI can understand thoughts and emotions, as well as interact socially. However, a machine based on this type is yet to be built.

### 4. Self-Aware

Self-aware machines are the future generation of these new technologies. They will be intelligent, sentient, and conscious

### How AI is set to change the education market:

The World Economic Forum estimates that, by 2025, a large proportion of companies will have adopted technologies such as machine learning. They strongly encourage governments and educational institutions to focus on rapidly increasing related education and skills, focusing on both STEM and non-cognitive soft skills to meet the impending need.

They need to: Know how to utilize ever-changing technology, such as AI, to their advantage. Understand how to work with other people in a team to -solve problem effectively. Preparing students to work alongside AI in the future can start early. As many children are already comfortable with digital technology before entering school, it's essential to teach them the skills to thrive in a digital workplace. The workforce of the future has its foundation in the now.

## Applications of AI

### 1. Robotics:

It is a well-known fact that Artificial Intelligence is the driving force behind robotics. The use of artificial intelligence in robotics has made possible the presence of robots in multiple industries like finance, marketing, and healthcare. For years, the field of robotics has attempted to imbibe human intelligence into machines that can think and work like humans. A real-life example of this application is the robot - Sophia . Considered to be a 'humanoid', Robot Sophia is a blend of a human and a robot with in-built abilities of both.

### 2. Outer Space Exploration:

Artificial Intelligence is not only present on Earth but in outer space too! When it comes to the applications of AI, machines have traversed outer space and led humans to explore outer space. Whether it is about Mars missions or satellite installments in the exosphere, AI is persistently heading towards the exploration of outer space. Some of the aspects that

involve the application of artificial intelligence in outer space exploration are map-building, satellite navigation, and location tracking technology.

### 3. Customer Service:

AI has facilitated the inclusion of machines in the realm of customer service too. Computers that intend to register the feedback of various customers visiting stores, shopping malls, or showrooms of big brands. Even the technology of ML chatbots (robots chatting with customers online) is one of the best ai applications that has expanded the use of robotics. With the simulation of human behavior and conversation styles of marketing personnel, chatbots deal with customers over online platforms. For instance, Amazon, an e-commerce platform incorporates chatbots in its customer service department. Herein, customers are made to chat with robots that intend to solve their queries or discrepancies related to purchases, orders, etc.

### 4. Stock Market and Finance:

Another one from the list of artificial intelligence applications is the finance sector. With the help of artificial intelligence algorithms, machines have now become capable of interpreting stock market performance in the past, analyzing the profits and losses of the relevant stocks, and even predicting the future stock market performance. Benefitting the sector of finance, AI has substantially contributed to the field in recent times. One such financial company - Nomura Group has successfully implemented the technology of AI. What's more, AI is paving its way into financial processes like transfer of payments, e-commerce platforms, and many more such realms.

### 5. Automated Cars:

Artificial Intelligence is the way how self-driving cars work. Automated cars are a typical example of applications of AI that explains the advancements of the field along with the automobile industry. The thought of cars driving by themselves with algorithms of artificial intelligence is the future of the automobile industry. Big corporations like Tesla have been working on automated cars and are heading towards this development. Owing to AI, humans will no longer need to drive cars or hire drivers for the same. This is how Tesla uses AI.

### 6. Digital Media:

The Internet is everywhere, and so is artificial intelligence! Another application of AI is digital media- helping social media platforms to verify fake news, understand obscenity or foul language hidden in comments or captions, and promoting brands online. These aspects of digital media and AI together give rise to virtual platforms that seem to know their users too well. Ever thought of why your Instagram is showing you advertisements of smartphones while you just searched for the same online? Well, AI is the answer. By interpreting data and analyzing patterns hidden behind the user interface, AI customizes our Google search engines, incorporates various digital marketing tools, and provides us with just the things we are looking for!

## 7. Healthcare Industry:

Healthcare is a basic amenity for all citizens of the world. While doctors and scientists have been working hard to bring about medicinal revolutions from time to time, AI is doing its bit by vastly contributing to the industry. The role of AI in healthcare enables machines to interpret the medical history of a patient and predict possible diseases that the individual can become vulnerable to in the coming years. More than that, AI has facilitated drug discovery and the formation of medicines that can cure harmful or even fatal diseases. The impact of AI on the industry has been eminent. Yet one such medical firm that has actively incorporated AI into the healthcare industry is IBM Watson Health. It assists in research, data analytics, and providing medical solutions to clients.

## 8. Facial Recognition:

Does your smartphone have the technology of facial recognition? If yes, then your smartphone is powered by AI. Thinking about how it is possible? Well, applications of AI involve facial recognition which focuses on learning and perceiving patterns that lead to quick and efficient outputs. So when you insert your selfie and register it for facial recognition, your phone learns a face recognition algorithm and the next time when you log in to your phone without entering the password, your phone easily unlocks with the help of your image alone. Facial recognition is also used for security and privacy purposes other than smartphones- airport, offices, etc.

## 9. Virtual Voice Auxiliaries:

Virtual Voice Auxiliaries like Siri and Alexa are developed in a way that involves artificial intelligence and its techniques like deep learning. By facilitating such voice assistants; AI focuses on imparting human intelligence among these tools that help them to perform human-like functions and tasks. As a result of multiple patterns and deep learning algorithms, such voice assistants successfully follow human commands and are thus, a real-life example of AI.

## 10. Fitness Applications:

Fitness is all that people crave today. Beginning from the number of total steps one has walked in a day to the number of calories one has burnt, fitness plays a major role in our lives. But so does AI! Artificial Intelligence has joined hands with fitness and has led to the release of fitness appliances like fitness bands and watches that help humans to detect their health levels, boost their fitness levels, and achieve goals.

## Impact of AI on Education and Learning:

### 1. Emotional Well-Being

A child's emotional status influences motivation, engagement, and concentration in learning. Virtual set-ups can be just as efficient as physical learning environments when emotion recognition technology is used. As gamification is acknowledged, learning and teaching can be adjusted to be fun. Moreover, AI can detect where learners are struggling and help them to improve and eventually excel.

### 2. Identifying and filling the gaps

AI can spot the gaps in educators' educational material and

presentations. Hence, it can recommend adjustments when required.

### 3. Chatbots

Chatbots are one example of AI. It is the future of all technical cores. Chatbots are being implemented increasingly in classrooms where students use laptops or iPads to chat with bots. It is designed to help them absorb specific subjects like reading comprehension or math. Chatbot has the potential to do more than just teach students new concepts. They can also help in the analysis if required. It reduces the burden of tasks assigned to the teachers. It can also swap email communications between parents and teachers as well as parent's meetings.

### 4. Learning Management System (LMS)

In this era of technology, it becomes mandatory to stay up to the minute with technological advancements in education. AI incorporated with LMS offers a centralized, insightful system for handling all of the online functions of a school. These can be implemented for several purposes. Although they are commonly used to perform Coursework assignment, Communication with parents, students and tracking the progress of the students and generating reports on student performance

### 5. Robotics

The use of AI with Robotics in education has augmented over the past few years. It can be implemented in the system for both teachers and students. It can improve student safety and engagement. The development of AI with robotics in education is certain. Robots can be an exceptional resource for learning for both educators and learners. Both can explore the topic in-depth with fun engagement. Robots can offer teachers a way to have more face-to-face teaching time with students who need extra help. It can enable them to experiment with new methods of teaching. For students, it provides the space to learn at their own pace without being judged by their peers. They get the liberty to make mistakes and learn from them.

### 6. Virtual Reality (VR)

AI with VR is already in use in the education industry. It teaches everything from history to help students with mathematics. VR is a 3-D computer-generated environment that can be explored and interacted with. VR can help students to stay connected with each other. Students can use the same VR program while sitting in different classrooms and can communicate safely despite the distance. Students and teachers can observe things that they might have never seen or learned about it in real life. The technology provides the opportunity for teachers to explore more engaging methods of teaching their students. An increase in engagement and in-depth understanding will be beneficial for both teachers and students.

## CONCLUSION

AI has a massive impact on the education sector. When used to its full potential, it can completely revamp the industry, giving the students an environment where they can thrive. AI can be helpful for teachers as well. It is efficient, convenient, and a practical choice when doing administrative tasks or collecting data.

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